

Remarks

In view of the following remarks, favorable reconsideration of the outstanding office action is respectfully requested. Claims 1 – 62 remain in the application. Claim 59 and claim 62 have been amended.

1. Allowed Claims/Subject Matter

Applicants note with appreciation the Examiner's allowance of claims 31 – 58, and claim 61.

Applicant also notes with appreciation that the Examiner has indicated the subject matter of claims 4 – 10, 15 – 19, and 22 are patentable, and would be allowable if rewritten in independent form.

2. § 102 Rejections

The Examiner has rejected claims 59 and 62 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,532,834 to Pinto et al. (hereinafter Pinto). The Applicants respectfully traverse the Examiner's rejection because he has failed to provide a prima facie case of anticipation, since he has failed to point out where each and every claim element is disclosed in the cited art. Nevertheless, the applicant has amended claim 59 and claim 62 to more clearly recite the applicant's invention.

Pinto is directed to a capacitive pressure sensor for measuring a pressure applied to an elastic member. The sensor includes a capacitive plate disposed adjacent to the elastic member so as to define a gap between a planar conductive surface of the elastic member and a corresponding planar surface of the capacitive plate. The gap, capacitive plate and elastic member together define a capacitor having a characteristic capacitance. The sensor further includes an elongated electrical conductor characterized by an associated inductance value. The conductor is mechanically connected to, and electrically coupled with, the capacitive plate. The gap between the capacitive plate and the elastic member varies as a predetermined function of the pressure applied to the elastic member so as to vary the characteristic capacitance. The capacitor and the inductor together form a tank circuit having a characteristic resonant frequency. When the capacitance of the tank circuit is varied, the resonant frequency of the tank circuit is varied in accordance with the pressure applied to the

elastic member. The tank circuit also moderates the effects of environmental influences such as temperature variations, vibration and shock.

According to **MPEP 2131**, “to anticipate a claim, the reference must teach every element of the claim.” A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

A. Pinto does not disclose a circuit board:

The Examiner asserts that Pinto discloses a circuit board in Figure 6. In particular, he asserts that reference numeral 214 is a circuit board. However, Figure 6 is discussed in col. 6, line 49 – col. 7, line 37. Pinto clearly identifies reference numeral 214 as an “electrode assembly” that includes capacitor plate 216, insulator 218, and planar inductor coil. The Examiner also relies on col. 5, lines 4 – 8. However, the cited text merely states that the capacitive plate and the inductor coil may be etched from a sheet of conductive foil using printed circuit board techniques. Applicant points out that the cited text does not describe electrode assembly 214 as a printed circuit board, and in fact, does not mention a printed circuit board in the discussion of column 5.

B. Pinto does not disclose a metallic diaphragm coupled to the circuit board and juxtaposed to the metallic layer to thereby form a transducer capacitor:

The Examiner asserts that Pinto discloses a metallic diaphragm coupled to the circuit board and juxtaposed to the metallic layer to thereby form a transducer capacitor. Applicant points out that Pinto does not disclose the arrangement recited in the claims because Pinto does not form a transducer using a metallic layer formed in a circuit board.

C. Pinto does not disclose an oscillator circuit disposed on the circuit board and coupled to the transducer capacitor

Applicant has amended claim 59 and claim 62 to include “an oscillator circuit disposed on the circuit board and coupled to the transducer capacitor. Assuming, strictly *arguendo*, that the electrode assembly 214 disclosed by Pinto could be viewed as a circuit board, which it is not, the electrode assembly 214 does include an oscillator circuit disposed thereon. Terminal 229 and terminal 231 are employed to connect electrode assembly 214 and

diaphragm 202, respectively, to an external oscillator circuit 136. Because inductor coil 220 is disposed on a first side of electrode assembly 214 and metallic layer 216 disposed on a second side of electrode assembly 214, Pinto provides no surface area for an oscillator circuit, or any other type of circuit. Pinto clearly does not contemplate such an arrangement.

Accordingly, Pinto does not disclose each and every element as set forth in claim 59 and claim 62. The Applicants respectfully assert that claim 59 and claim 62 are allowable under 35 U.S.C. § 102(e). Applicants respectfully request that the rejection under 35 U.S.C. § 102(e) be withdrawn.

3. § 103 Rejections

A. Pinto in view of Bronowocki et al.

The Examiner has rejected claims 1, 2, 11 – 14, 20, 21, 23, 24, and 26 – 30 under 35 U.S.C. § 103(a) as being unpatentable for obviousness over Pinto in view of U.S. Patent No. 5,591,900 to Bronowocki et al. (hereinafter Bronowocki). The Applicants respectfully traverse the Examiner's rejection because he has failed to provide a *prima facie* case of obviousness, since he has failed to point out where each and every claim element is disclosed by the combination of references, and because he has failed to provide a proper reason for combining the references.

Pinto was discussed above in Section 2.

Bronowocki is directed to a method and apparatus for measuring the fluid pressure in a sealed vessel. The invention has particular application for diagnostic testing of a pressurized fluid vessel of an air bag restraint system. In particular, the apparatus includes a piezoelectric transducer adjacent to the vessel. The transducer outputs an initial noise signal to the vessel. Subsequently, a receiver monitors the fluid vibrations, and a monitoring circuit monitors for a frequency functionally related to the natural frequency of the fluid. A drive circuit subsequently drives the piezoelectric transducer at the frequency functionally related to the natural frequency of the fluid.

According to the **MPEP 2143**, three basic criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when

combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

1. The prior art references do not teach or suggest all of the claim limitations

a.) Neither Pinto nor Bronowocki disclose a circuit board

The Examiner again asserts that Pinto discloses a circuit board in Figure 6. In particular, he asserts that reference numeral 214 is a circuit board. However, Figure 6 is discussed in col. 6, line 49 – col. 7, line 37. Pinto clearly identifies reference numeral 214 as an “electrode assembly” that includes capacitor plate 216, insulator 218, and planar inductor coil. The Examiner also relies on col. 5, lines 4 – 8. However, the cited text merely states that the capacitive plate and the inductor coil may be etched from a sheet of conductive foil using printed circuit board techniques. Applicant points out that the cited text does not describe electrode assembly 214 as a printed circuit board. As noted above, Pinto does not mention or describe a printed circuit board in conjunction with reference numeral 214.

The Examiner does not assert that Bronowocki remedies the deficiencies of Pinto. Thus, the Examiner does not shown where either Pinto or Bronowocki, whether taken alone or in combination, teach or suggest the printed circuit board recited in claim 1.

b.) Neither Pinto nor Bronowocki disclose a metallic diaphragm coupled to the circuit board and juxtaposed to the metallic layer to thereby form a transducer capacitor

The Examiner again asserts that Pinto discloses a metallic diaphragm coupled to the circuit board and juxtaposed to the metallic layer to thereby form a transducer capacitor. Applicant points out that Pinto does not disclose the arrangement recited in the claims because Pinto does not form a transducer using a metallic layer formed in a circuit board.

The Examiner does not assert that Bronowocki remedies the deficiencies of Pinto. Thus, the Examiner does not shown where either Pinto or Bronowocki, whether taken alone or in combination, teach or suggest the metallic diaphragm recited in claim 1.

c.) Neither Pinto nor Bronowocki disclose an oscillator that includes a low pass filter:

This claim element is recited in both claim 1 and claim 21. The Examiner admits that Pinto does not include this element. However, the Examiner asserts that Bronowocki teaches an oscillator with a low pass filter. The Examiner points to the low pass filter 228 shown in Figure 8. In particular, the Examiner asserts that Bronowocki discloses an oscillator 240 coupled to a LP filter 228 and a transducer capacitor 200. A thorough reading of Bronowocki does not provide a concurrence with the Examiner's explanation. First, reference numeral 200 is not a capacitor, rather it is a "piezoelectric patch actuator assembly" configured to generate an acoustic wave in the wall of vessel 30 (col. 9, lines 47 – 54). Second, reference numeral 240 is not an oscillator, it is a signal compensator block that includes charge amplifier 224, band-pass filter 226, LP filter 228, and voltage amplifier 230 (col. 10, lines 3 – 5). Block 240 converts and processes charge received from piezoelectric sensor 202 into a voltage signal to magnify and process the signal being fed-back to actuator 200 (Col. 9, line 62 – col. 10, line 14). Finally, LP filter 228 is not applicable to the claimed invention because its function is to attenuate vibrational frequencies outside a desired range of vibrational frequencies (Col. 10, lines 6 – 10).

Thus, the Examiner does not shown where either Pinto or Bronowocki, whether taken alone or in combination, teach or suggest the oscillator recited in claim 1 and claim 21.

Accordingly, the prior art references do not teach or suggest all the claim limitations. Claims 2 – 20 and 22 – 30 are allowable by virtue of their dependency from claim 1 and claim 21, respectively. The Applicants respectfully assert that claims 1 – 30 are allowable under 35 U.S.C. § 103(a). Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) be withdrawn.

2. There is no proper suggestion or motivation to combine reference teachings

According to MPEP 2143.01, "if the proposed combination would change the principle of operation of the prior art invention being modified, then the teachings of the references are sufficient to render the claims prima facie obvious." In this case, one of ordinary skill in the art would not be motivated to combine Bronowocki with Pinto because it would change the principle of operation of the Pinto reference. The oscillation circuit of Pinto provides a frequency that is indicative of the pressure applied within an elastic member.

On the other hand, compensator circuit 240 provides a filtered voltage signal that is configured to generate vibrations in vessel 30 via a piezoelectric element 30. Thus, the principle of operation of the two references are completely different.

B. Pinto in view of Pechoux

The Examiner has rejected claim 60 under 35 U.S.C. § 103(a) as being unpatentable for obviousness over Pinto in view of U.S. Patent No. 6,418,793 to Pechoux et al. (hereinafter Pechoux). The Applicants respectfully traverse the Examiner's rejection because he has failed to provide a prima facie case of obviousness, since he has failed to point out where each and every claim element is disclosed by the combination, and because he has failed to provide a proper motivation for combining the references.

The teachings of Pinto were discussed above in detail.

Pechoux teaches a pressure sensor that includes a differential pair of capacitors having a movable plate. The sensor includes a measurement circuit for measuring the capacitance of the capacitor. The circuit is incorporated in the housing of the sensor and is made up of first and second double-sided interconnected circuits which are situated on either side of the membrane and which are connected thereto in its peripheral region by connection means.

1. The prior art references do not teach or suggest all of the claim limitations

a.) Neither Pinto nor Pechoux disclose a conductive ring or the pressure port assembly as recited in claim 60

The Examiner admits that Pinto does not disclose a conductive ring. However, the Examiner asserts that, in Figure 2, Pechoux discloses a conductive ring (reference numeral 8) disposed between a metallic diaphragm 7 and circuit board 13. However, reference numeral 8 refers to shim 8a and shim 8b with metallic diaphragm 7 disposed therebetween. Pechoux includes a pressure port 9a that is formed in pressure port housing 2. Pressure port housing 2 and circuit board 13a form cavity 5a. Thus, the cavity is between the pressure port and the circuit board. On the other hand, claim 60 recites that a pressure port assembly is coupled to the conductive ring, whereby a cavity is formed between the pressure port and the metallic diaphragm. Neither Pinto nor Pechoux teach or suggest this limitation.

Accordingly, the Applicant points out that neither Pinto nor Pechoux, whether taken alone or in combination teach or suggest all of the features recited in claim 60.

2. There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine reference teachings.

The Examiner argues that one of ordinary skill in the art would be motivated to combine Pechoux with Pinto because the combination would ensure that electrical connections were made so that results were more consistent and accurate. The Examiner relies on col. 4, line 66 to col. 5, line 1 in support of this proposition.

The Applicant points out that **MPEP 2143.01** states that a proposed combination cannot change the principle of operation of the invention being modified. In this case, Pinto employs a single capacitor to measure the pressure in variable pressure region 204 (See Figure 6). The pressure is measured by providing an oscillating signal having a frequency proportional to the pressure. In a col. 4, line 66 to col. 5, line 1, Pechoux discloses metal shims 8, which are used to connect circuit 13a with circuit 13b. The two circuits, 13a and 13b, are connected so as to measure a DC voltage “U,” which is a function of the difference between the pressures existing in region 5a and region 5b. One of ordinary skill in the art would not be motivated to combine Pechoux with Pinto, because Pinto has no need for the electrical connections facilitated by the shims (8) disclosed by Pechoux, because Pinto does not require two circuits (13a and 13b). Further, modifying Pinto by using features of Pechoux would require a change in the principle of operation of the Pinto invention because Pechoux is directed to a differential sensor whereas Pinto is not.

Accordingly, the Applicants respectfully assert that claim 60 is allowable under 35 U.S.C. § 103(a). Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) be withdrawn.

C. Dependent Claim Rejections

The Examiner has rejected claim 3 under 35 U.S.C. § 103(a) as being unpatentable for obviousness over Pinto in view of Bronowocki as applied to claim 1, and further in view of Pechoux. Claim 3 is allowable by virtue of its dependency from claim 1 because, as pointed out above, neither Pinto nor Bronowocki teach or suggest all of the limitations of claim 1.

Pechoux does not remedy the deficiencies of the combination of Pinto and Bronowocki. Further, the references are not properly combinable for the reasons provided above.

The Examiner has rejected claim 25 under 35 U.S.C. § 103(a) as being unpatentable for obviousness over Pinto in view of Bronowocki as applied to claim 21, 23, and 24, and further in view of Wallrafen. Claim 25 is allowable by virtue of its dependency from claim 21 because, as pointed out above, neither Pinto nor Bronowocki teach or suggest all of the limitations of claim 21. Wallrafen does not remedy the deficiencies of the combination of Pinto and Bronowocki. Further, the references are not properly combinable for the reasons provided above.

4. Conclusion

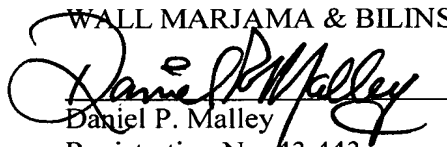
Based upon the remarks and papers of record, Applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests reconsideration of the pending claims 1 – 62 and a prompt Notice of Allowance thereon.

Applicant believes that no extension of time is necessary to make this Response timely. Should Applicant be in error, Applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Response timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 50-0289.

Please direct any questions or comments to Daniel P. Malley at (607) 256-7307.

Respectfully submitted,

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